

9876-M-1

DC POWER SUPPLY



LEEDS & NORTHRUP

SPECIFICATIONS

DC OUTPUT RANGES

0-10 V

0-100 V.

MAXIMUM OUTPUT CURRENT

0-10 Volts Range

800 mA up to 6 V

100 mA up to 10 V

0-100 Volts Range

20 mA up to 100 V

METER ACCURACY

0-10 Volts Range

± 0.2 V

0-100 Volts Range

± 2.5 V

LINE POWER INPUT

120 V, 50/60 Hz.

PHYSICAL CHARACTERISTICS

Size: 19 inches by 5-1/4 inches by 8 inches.

Weight: About 8 pounds.

9876-M-1

DC POWER SUPPLY

1. GENERAL DESCRIPTION

The 9876-M-1 DC Power Supply, shown in Fig. 1, is a line-operated bridge-voltage supply. It is specifically designed for use with the L&N 4232-3-B Guarded Wheatstone Bridge or with any similar bridge that requires the connection of an unguarded voltage supply between the junction of its ratio arms and the junction of its balancing and unknown-resistance arms. The power supply operates from an ac input of 100-130 volts, 50-60 hertz to provide a dc output that can be varied from either 0 to 10 volts* or 0-100 volts.*

The 9876-M-1 DC Power Supply is a completely self-contained unit, designed for mounting on a panel.

A line switch, pilot light, dc voltmeter, range switch, and increase-voltage control are mounted on the front panel of the power supply. A line cord, output binding posts, and input and output fuses are located at the rear of the power-supply chassis.

2. DESCRIPTION OF FRONT PANEL AND CHASSIS FEATURES

LINE Switch—Applies line power to the primary winding of the power transformer.

Pilot Light—Indicates that the power supply is energized.

RANGE Switch—Selects either the 0-10 or 0-100 volt dc output of the power supply. Also selects the proper output filter and voltmeter circuit.

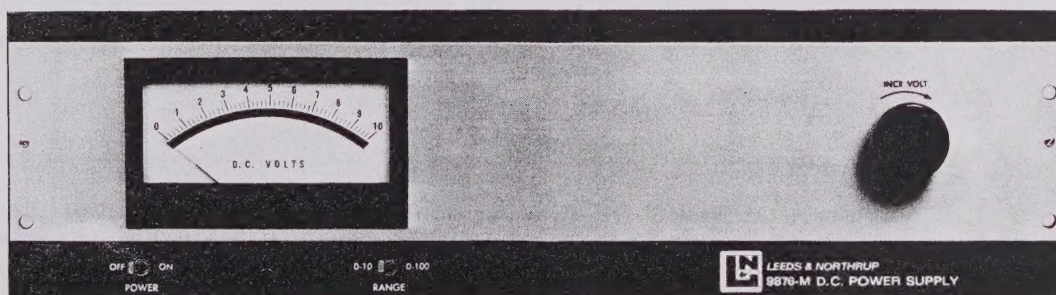


Fig. 1—9876-M-1 DC Power Supply.

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*Full scale on meter.

INCREASE VOLTAGE Control—Adjusts the variable transformer to increase or decrease the magnitude of the dc output voltage.

DC Voltmeter—Indicates the magnitude of the dc output voltage.

OUTPUT DC Binding Posts—Permit connection of the dc output voltage to a Wheatstone bridge.

Input Fuse—Protects the power line from overloads greater than 1/4 ampere caused by an inadvertent failure of the power supply.

Output Fuse—Protects the secondary windings of the power transformer from overloads greater than 0.8 ampere caused by improper voltage settings when measuring low resistances.

3. TECHNICAL INFORMATION

The schematic diagram of the 9876-M-1 DC Power Supply is shown in Fig. 2. As indicated by this diagram, ac line voltage is applied to the primary winding of power transformer T1 through isolating transformer T3, and to pilot light DS1 by LINE switch S1, thereby energizing the power supply and pilot light. RANGE switch S2 connects either the 0-10 volt or 0-100 volt secondary winding of the power transformer to variable transformer T2, whose output can be varied by the INCREASE VOLTAGE control. The ac output of the variable transformer, in turn, is applied to the full-wave bridge-rectifier circuit consisting of diodes CR1, CR2, CR3, and CR4.

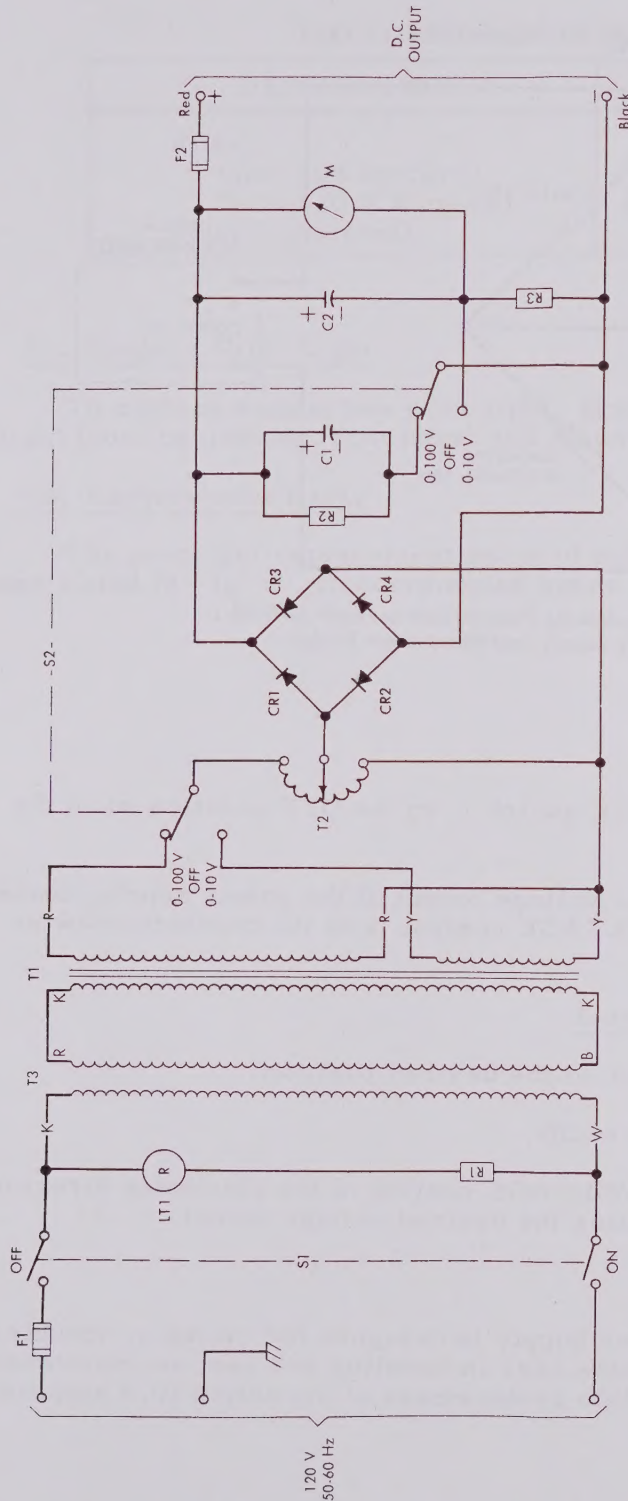
When the RANGE switch is in the 0-10 volt position, the output of the bridge-rectifier circuit is filtered by the parallel 50-microfarad capacitor C2; the dc voltmeter is connected between the OUTPUT DC binding posts and directly indicates the magnitude of the output voltage. When the RANGE switch is in the 0-100 volt position, the output of the bridge-rectifier circuit is filtered by the parallel 80-microfarad capacitor C1; the dc voltmeter is connected in series with the 91,000-ohm voltage-dropping resistor R3 and indicates one-tenth of the magnitude of the output voltage. The two separate filter circuits are employed so that the dc voltmeter will not be subjected to a 100-volt transient, whenever the output of the power supply is switched from the 0-100 to the 0-10 volt range.

4. OPERATING INSTRUCTIONS

4A. Wiring Connections

Connect the + OUTPUT DC binding post (red) to the junction of the ratio arms of the Wheatstone bridge and the - OUTPUT DC binding post (black) to the junction of the balancing arm and unknown resistance arm as indicated in Fig. 3.

Plug the line cord into the receptacle of a suitable 120-volt, 50-60 hertz power source.



BE3678(A)

E3678(B)

MISCELLANEOUS PARTS

	L&N Part No.
CR1 Diode (750 MA 200 PIV)	057028
CR2 Diode (750 MA 200 PIV)	057028
CR3 Diode (750 MA 200 PIV)	057028
CR4 Diode (750 MA 200 PIV)	057028
F1 Fuse (1/4 A Slo-Blo 3AG)	014047
F2 Fuse (0.8 A Slo-Blo 3AG)	014111
LT1 Pilot Light (red)	026152
M Voltmeter (0-10 V d-c)	021208
S1 Line Switch	032573
S2 Range Switch	032573
T1 Power Transformer (Primary - 118 V 50-60Hz; Secondary - 100 V 20 MA and 10 V 800 MA)	019301
T2 Variable Transformer	019181
T3 Isolating Transformer	019260

RESISTORS

	L&N Part No.
R1 220KΩ ± 10% 1/2 W	011172
R2 22KΩ ± 10% 1/2 W	011160
R3 91KΩ ± 1% 1/2 W	011580

CAPACITORS

	L&N Part No.
C1 80 uf 150 WV	023029
C2 50 uf 150 WV	023020

Fig. 2—Schematic diagram of 9876-M-1 DC Power Supply.

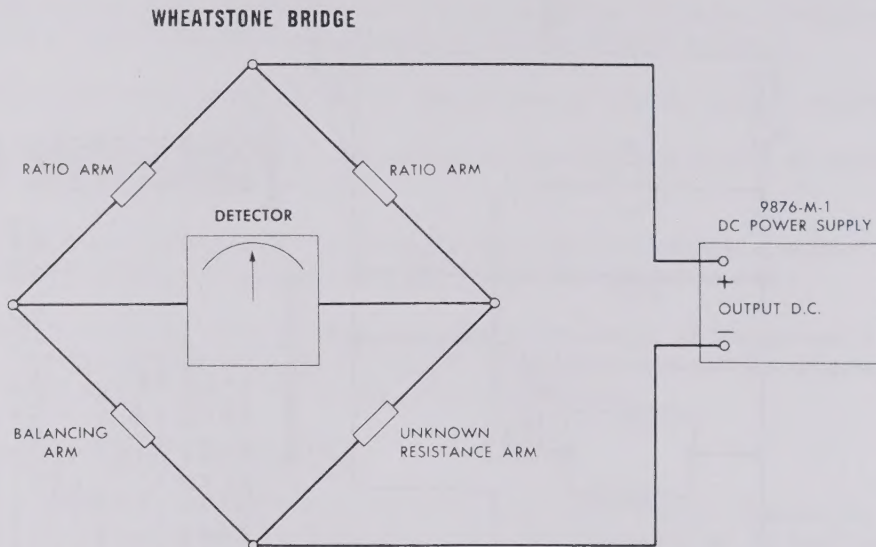


Fig. 3—Diagram showing connections between 9876-M-1 DC Power Supply and Wheatstone Bridge.

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4B. Precautions

- Make sure that the LINE switch is in the OFF position when the power supply is not in use.
- Before adjusting the dc voltage output of the power supply, make sure that the INCREASE VOLTAGE control is at its counterclockwise limit.

4C. Adjust DC Voltage Output

- Snap the RANGE switch to the desired position.
- Snap the LINE switch to ON.
- Turn the INCREASE VOLTAGE control in the clockwise direction until the dc voltmeter indicates the desired voltage output.

5. MAINTENANCE

The 9876-M-1 DC Power Supply is designed for reliable, trouble-free service. With reasonable care in handling and use, no maintenance is required other than possible replacement of the output (0.8 ampere) fuse and pilot light.

TABLE I-RECOMMENDED SPARE PARTS

DESCRIPTION	L&N PART NO.
Fuse	
Input (1/4 ampere)	014047
Output (0.8 ampere)	014111
Pilot Light (red)	026152

5A. Replace Pilot Light

To replace a defective pilot light, simply unscrew the defective light from behind the front panel and mount a new light in its place.

5B. Replacement Parts

The principal replacement parts of the 9876-M-1 DC Power Supply are listed in Fig. 2. Recommended spare parts are listed in Table I.

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